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(54) **FOUR-WAVE MIXING SOURCE OF SQUEEZED LIGHT FOR IMAGE PROCESSING AND INTERFEROMETRY**

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(57) **ABSTRACT**

A four-wave mixing squeezed light source includes: a mixing medium having chi(3) non-linear characteristics including two atomic ground states coupled to each other by transitions through optically-excited states; a pump beam having a polarization and a frequency, said frequency being near the ground-to-excited atomic transition but far enough from the atomic transition such that the pump beam is substantially unabsorbed; and a probe beam having a polarization that is orthogonal with respect to the pump beam polarization, the probe beam having a frequency of the pump beam frequency plus or minus a frequency splitting of the two atomic ground states. The mixing medium, the pump beam and the probe beam interact to produce a phase conjugate beam having a polarization that is orthogonal to the pump beam polarization, such that the beams are non-degenerate with the pump beam, and the probe beam is amplified.